

# इंटरनेट

# मानक

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IS 7080-2 (1992): MTP Suction Apparatus, Part 2:  
Electrical-cum-manually Operated [MHD 3: Obstetric and  
Gynaecological Instruments and Appliances]



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“Knowledge is such a treasure which cannot be stolen”



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भारतीय मानक

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भाग 2 विद्युत एवं मानव चालित

( पहला पुनरीक्षण )

*Indian Standard*

**MTP SUCTION APPARATUS —  
SPECIFICATION**

**PART 2 ELECTRICAL-CUM-MANUALLY OPERATED**

*( First Revision )*

UDC 615.478.76-83

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**BUREAU OF INDIAN STANDARDS**  
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## FOREWORD

This Indian Standard ( Part 2 ) ( First Revision ) was adopted by the Bureau of Indian Standards, after the draft finalized by the Obstetric and Gynaecological Instruments and Appliances Sectional Committee had been approved by the Medical Equipment and Hospital Planning Division Council.

The Indian Standard on suction abortion apparatus was first published in 1973. It was revised in 1981 and published in two parts namely :

Specification for MTP suction apparatus:

( Part 1 ) Manual and electrical

( Part 2 ) Electric-cum-manual

MTP suction apparatus is an important device used in connection with implementation of various family welfare programmes. Therefore, at the instance of the Ministry of Health and Family Welfare, this standard has been further revised to update its requirements and also to specify the latest technical developments. In this revision, the earlier Part 1 has been split into two parts namely:

Part 1 Manually operated

Part 3 Electrically operated

The requirements of Part 2 have also been revised in line with the other parts.

In the revised version of the standard on MTP Suction Apparatus the following changes have been made:

- a) The design and shape of the cannula has been changed to have more effective suction performance;
- b) Requirement of vacuum in relation to the time have been specified; and
- c) Provision for providing one extra PVC tubing of 2 metre length and 8 mm diameter to be used with cannula has also been made.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

# Indian Standard

## MTP SUCTION APPARATUS — SPECIFICATION

### PART 2 ELECTRICAL-CUM-MANUALLY OPERATED

### ( First Revision )

#### 1 SCOPE

**1.1** This standard (Part 2) covers the dimensional, performance and general requirements of electrical-cum-manually operated MTP suction apparatus together with the applicator required for medical termination of pregnancy.

#### 2 REFERENCES

**2.1** The Indian Standards given in Annex A are necessary adjuncts to this standard.

#### 3 SHAPE AND DIMENSIONS

##### 3.1 Cannula

**3.1.1** The shape and dimensions of the cannula shall be as shown in Fig. 1. The right hand side end of cannula is fitted into a tubing connected to the suction apparatus, either directly or through an appropriate holder which allows the cannula to rotate freely through 360°. The plastic cannula is fitted in the similar manner as the metal cannula but it may or may not have calibrations.

##### 3.1.2 Tolerances

A tolerance of  $\pm 2.5$  percent shall be allowed on all dimensions.

#### 4 MATERIALS

**4.0** Materials used for MTP suction apparatus shall be as follows:

##### 4.1 Metal Parts

The metal components shall be constructed of steel having corrosion resistant properties or they shall be given durable surface finish suitable for giving adequate protection against corrosion under conditions of normal use.

##### 4.2 Rubber Components

The rubber components shall be made of good quality natural or synthetic rubber and shall be capable of ageing in an air-oven for 168 hours at  $70 \pm 1^\circ\text{C}$  without showing appreciable stiffening, softening, cracking or other changes in condition.

##### 4.3 Glass Parts

The glass parts shall be made of clear glass or borosilicate glass. They shall be free from visual defects and internal strains.

##### 4.4 Plastic Parts

The raw material used for plastic parts shall be suitable for the purpose intended.

##### 4.5 Aluminium Parts

Aluminium of required strength and properties suitable for the purpose intended shall be used. Aluminium parts shall be anodized.

##### 4.6 Cannula

Stainless steel seamless drawn tube conforming to designation 04Cr19Ni9 or 07Cr19Ni9 of Schedule V of IS 1570 : 1961 or flexible Karman type conforming to IS 8313 : 1977.

##### 4.7 Tubing

The tubing shall be of transparent PVC. It shall preferably be corrugated.

##### 4.8 Castor Wheels

Castor wheels, if provided, shall be normal duty castors of suitable size conforming to IS 4034 : 1979. The castors shall be antistatic.

#### 5 CONSTRUCTION

**5.1** The manual part of the pump shall be operatable by either hand or foot but it shall be so incorporated along with the electrical system in the main unit that it forms a single unit. However, the mechanism shall work independent of each other, so that the suction apparatus could be used simultaneously, if required.

##### 5.2 Cannula

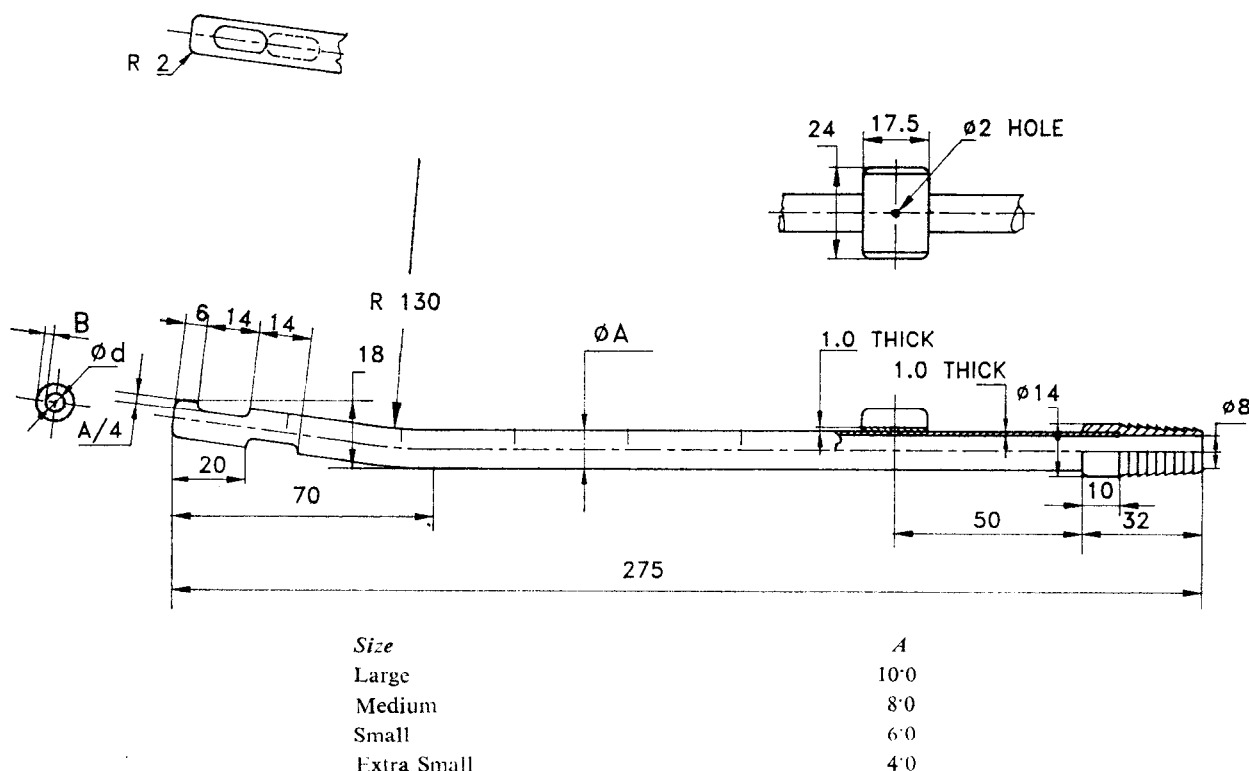
The material for construction of cannula shall be as given in 4.6. It may or may not be provided with a holder to facilitate its holding and free rotation.

##### 5.3 Base

It may be made from fibreglass or any other suitable material and shall be of suitable section and thickness so as to provide stability and sturdiness. It shall have smooth edges and corners and shall have rubber supports at the bottom.

##### 5.4 Handle

For convenience of holding and carrying the MTP unit, a suitable smooth handle shall be provided.



NOTE — Dimensions 'B' shall depend on dia 'A' to get maximum dia 'd'. However the tip shall be rounded off smoother and free of any sharp edges.

All dimensions in millimetres.

FIG. 1 CANNULA, MTP SUCTION APPARATUS

## 6 GENERAL REQUIREMENTS

6.1 The MTP unit shall be so designed and constructed that it has adequate mechanical strength and shall withstand the requirements it is expected to perform in normal use.

6.2 The design of MTP unit shall be such as to provide adequate stability. It shall not overturn when placed in unfavourable position, such as, inclined plane at an angle of  $10^\circ$  to the horizontal and shall continue to function satisfactorily.

6.3 The tubing shall be non-collapsible under a pressure of 700 mm of Hg shall be transparent and smooth from inside. The tubing shall preferably be corrugated. Two pieces of tubing each of minimum two metre length and 2 mm wall thickness shall be provided with each apparatus. The inner diameter of these tubes shall be 8 mm and 10 mm. The tubing shall have antistatic properties.

6.4 The vacuum gauge shall be of Bourdon tube type conforming to IS 3624 : 1987. The scale markings shall be black on white background. The readings shall be in units of millimetres of mercury column. It shall be mounted in such a manner that it is easily visible during use.

6.5 There shall be one bottle of 1.5 litres capacity for each system. However, if desired by the user, higher capacity bottle may be used for electrical system. The bottles shall be sufficiently wide mouthed to facilitate inside cleaning. Bottles may be of glass or unbreakable non-collapsible plastic. The lid and its connections to the suction bottle shall provide a leak-proof assembly. It shall be capable of easy removal and shall stand steam sterilization at not less than  $120^\circ\text{C}$ . The bottle shall be graduated at 50 ml intervals. Leakproof stopcock may be provided on the lid, if required by the purchaser.

6.6 An overflow cut-off valve shall be provided between the suction bottle and the pump to prevent the aspirated fluid from entering the suction line.

6.7 The exhaust air shall be discharged from the apparatus through an outlet to the outside but not directly on to the floor. The exhaust outlet shall be so designed that the suction tubing cannot erroneously be connected to it.

6.8 The mass of the MTP unit shall not exceed 24 kg.

**6.9** The MTP unit shall be provided with suitable bacterial filter cartridge between suction bottle and suction pump to protect it from entrained moisture or from flooding due to overflow of suction bottle. The filter cartridge shall have provision for easy replacement of filters and it shall be possible to clean the traps easily. The filter cartridge and connections shall be easily removable and shall withstand repeated sterilization at 120°C.

**6.9.1** Two filter cartridges shall be provided with each apparatus.

**6.9.2** Material used for the filter shall be non-absorbent cotton or its equivalent.

## 6.10 Switches and Wiring

The switches and wiring used shall be rated to handle the maximum load that may occur under normal operating conditions and continuous use. The switches shall be so placed and fixed as to be convenient to operate and shall not become defective or loose during the operation. They shall be explosion proof and shall be marked to indicate the 'OFF' and 'ON' positions.

**6.11** The vacuum unit shall be explosion proof and shall not produce sparks during operation. It shall be mounted in such a way as to produce minimum vibrations.

**6.12** The MTP unit shall satisfy the test for noise level specified in 10.7 of Part 3 of this standard.

**6.13** Castor wheels shall be provided on the MTP suction apparatus.

**6.14** The suction apparatus shall be provided with a fine adjustment vacuum control valve placed either before or after the air filter at convenient and easily accessible place for control of vacuum.

**6.15** The suction apparatus shall have a light indicator to indicate that the apparatus is 'ON'.

## 7 SAFETY REQUIREMENTS

**7.1** Each MTP unit shall satisfy the following safety requirements in accordance with the corresponding clauses of IS 302 : 1979 :

<i>Requirements</i>	<i>Clause No.</i>
Protection against electric shock	8
Electrical insulation and leakage current at operating temperature	13
Stability and mechanical hazards	20
Mechanical strength	21
Supply connections	25
Terminals	26
Earthing	27
Screws and connections	28
Resistance to rusting	31

## 8 WORKMANSHIP AND FINISH

### 8.1 Cannula

**8.1.1** All surfaces of cannula shall be free from pits, dents, burrs scales and other defects. Working end of cannula shall be well formed.

**8.1.2** The cannula provided shall conform to Fig. 1. Alternatively cannula having same dimensions of working end and other end having suitable arrangement of handle and vacuum release may be provided.

**8.1.3** Stainless steel cannula shall be polished bright.

### 8.2 Valves and Stopcocks

All valves and stopcocks shall be leakproof.

**8.3** The suction apparatus shall be free from any imperfections which may affect its appearance or impair its serviceability. The apparatus shall operate smoothly and noiselessly and shall perform its functions efficiently in a manner suitable for the purpose intended.

NOTE — It is important that continuity of contact between various metallic parts is maintained. To ensure this, the holes to receive rubber buffers should be drilled and tapped after stoving to remove any enamel or other insulating material as the antistatic properties of rubber buffers or lining could be destroyed by an insulating finish.

**8.4** The components made from brass shall be plated chromium over nickel in accordance with Grade 2 of IS 4827 : 1983.

**8.5** All components and the housing made from mild steel or cast iron shall be either plated chromium over nickel in accordance with service Grade 2 of IS 1068 : 1985 or shall be painted in accordance with the procedure given in 7.5.1 to 7.5.3 of Part 1 of this standard.

**8.5.1** The components shall be pickled, scrubbed and rinsed to remove grease, rust, scale or any other foreign matter.

**8.5.2** After pickling, all components shall be given phosphating treatment in accordance with IS 3618 : 1966, followed by a coat of suitable primer conforming to IS 2074 : 1979 for air drying process and IS 2075 : 1979 for stoving process. Filler shall be applied to all surfaces requiring filling.

**8.5.3** Two coats of enamel paint shall then be applied as follows :

- Undercoat, and
- Finish coat with synthetic stoving enamel conforming to IS 150 : 1950 or IS 151 : 1985, as required by the purchaser.

**8.5.3.1** The components shall thereafter be baked suitably in an oven. The resulting finish shall be free from all visible defects and shall satisfy the adhesion test in 9.1.



## 9 TESTS

### 9.1 Adhesion Test

A square measuring 12 to 15 mm shall be marked over conveniently selected spot on the painted surface. Cross lines, at a distance of 1 to 1.5 mm apart and inclined at 120°, shall be inscribed over the marked portion with a pointed instrument. Thereafter, cellulose tape shall be applied over this portion and left for two minutes; after which it shall be jerked free from the painted surface. If more than 5 percent of the squares are ripped away from the painted surface and are adhering to the cellulose tape, the whole surface of the apparatus shall be repainted and again subjected to this test now at two conveniently selected spots and the item considered passing only if found satisfactory in both the cases.

**9.2** The complete system shall be checked for leakproofness. There shall be no leakage of vacuum in the apparatus.

**9.3** The tubings shall be capable of withstanding a vacuum of 700 mm of Hg without collapsing.

**9.4** The manual unit shall be capable of giving a vacuum of 650 mm of mercury column within 12 strokes of the piston of the pump when measured up to 200 metres above the mean sea level.

**9.4.1** The electric unit shall be capable of giving a vacuum of 500 mm of mercury column in 10 seconds and 700 mm of mercury column within 50 seconds with a minimum free displacement rate of 25 to 30 l/min when measured up to 200 metres above the mean sea level. The vacuum unit shall be explosion proof and shall not produce sparks during operation. It shall be mounted in such a way as to produce minimum vibrations.

**9.5** The apparatus shall have adequate mechanical strength and shall be constructed to withstand such rough usage as may be expected in use.

**9.5.1** The protective enclosures, guards and other similar components shall have adequate mechanical strength and shall not be removable without the use of tools unless normal maintenance necessitates their removal.

**9.6** The glass/plastic bottle shall be capable of repeated steam sterilization at 120°C.

**9.7** The noise level shall be such that the noise level meter when situated at a distance of 1.2 m from the machine, shall not record an increase greater than 10 dB when the background noise level is 45 dB. The instrument shall be in accordance with IS 9779 : 1981 using A-weighting network.

## 10 INSTRUCTIONS MANUAL

**10.1** Each suction apparatus shall be provided with a manual giving necessary instructions and precautions to be taken for its proper use. The instruction manual shall include technical specifications of the apparatus and a list of accessories and spare parts supplied with the equipment.

## 11 MARKING

**11.1** The suction apparatus shall be marked clearly and indelibly in accordance with 7 of IS 302 : 1979 on its outer surface or on a plate firmly attached to it. In addition, there shall be permanent marking at the appropriate place to indicate the following:

- a) The direction in which the vacuum control valve shall be turned to obtain an increase in suction,
- b) Position of 'exhaust outlet', and
- c) Any other important precaution regarding the use of the apparatus and other components.

**11.2** The following instruction regarding change of filter shall be marked at appropriate place on the apparatus:

'The filter provided with the apparatus should be changed after every normal days use'.

**11.3** The unit shall be marked with the indication of the source of manufacture.

**11.4** Cannula shall also be marked with the indication of the source of manufacture and size number and 'SS' if made of stainless steel.

## 12 PACKING

**12.1** The MTP suction apparatus shall be packed as agreed to between the purchaser and the supplier. Care shall be taken to ensure that there is no contact between different components and that it is not damaged during transportation.

**ANNEX A**

( Clause 2.1 )

**LIST OF REFERRED INDIAN STANDARDS**

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
150 : 1950	Ready mixed paint, brushing, finishing, stoving for enamel colour as required	2075 : 1979	Ready mixed paint, stoving, red oxide-zinc chrome, priming ( <i>first revision</i> )
151 : 1985	Ready mixed paint, spraying, finishing, stoving enamel, for general purposes, colour as required ( <i>first revision</i> )	3618 : 1966	Phosphate treatment of iron and steel for protection against corrosion
302 : 1979	General and safety requirements for household and similar electrical appliances ( <i>fifth revision</i> )	3624 : 1987	Pressure and vacuum gauges ( <i>second revision</i> )
1068 : 1985	Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium on iron and steel ( <i>second revision</i> )	4034 : 1979	Castors for hospital equipment ( <i>first revision</i> )
1570 : 1961	Schedules for wrought steels for general engineering purposes	4827 : 1983	Electroplated coatings of nickel and chromium on copper and copper alloys ( <i>first revision</i> )
2074 : 1979	Ready mixed paint, air drying, red oxide-zinc chrome, priming ( <i>first revision</i> )	8331 : 1977	Cannula, flexible, Karman type
		9779 : 1981	Sound level meters

### **Standard Mark**

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.